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Indian Standard

SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPER

PART 3 WIPER ARMS AND BLADES

Section 2 Wiper Blades

UDC 629·113·011·673-83

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Indian Standard

SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPER

PART 3 WIPER ARMS AND BLADES

Section 2 Wiper Blades

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SPECIFICATION FOR ELECTRICAL WIND SCREEN WIPER

PART 3 WIPER ARMS AND BLADES

Section 2 Wiper Blades

0. FOREWORD

0.1 This Indian Standard (Part 3/ Sce 2) was adopted by the Indian Standards Institution on 25 February 1985, after the draft finalized by the Automative Electrical Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

0.2 This standard deals with the performance requirements and methods of tests for wind screen wiper blades for automobiles. The wiper arms are covered in Section 1 of this standard.

0.3 This is one of a series of Indian Standards on electrical wind screen wipers for automobiles. Other standards so far published in this series are:

IS: 7827 (Part 1)-1975 Specification for electrical wind screen wipers: Part 1 Wiper system

IS: 7827 (Part 2)-1975 Specification for electrical wind screen wipers: Part 2 Wiper motors

0.4 In preparing this standard assistance has been derived from JIS D 5710-1969 'Wiper blades and wiper arms for automobiles' published by the Japanese Standards Association.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part 3/Sec 2) covers the performance requirements and methods of tests for wind screen wiper blades for automobiles.

---

*Rules for rounding off numerical values (*revised*).

1.1.1 This standard does not apply to:

a) three wheelers, and
b) vehicles of special design intended for purposes other than transport of people or goods.

2. TERMINOLOGY

2.1 For the purpose of this standard the following definitions, in addition to those given in IS : 7827 (Part 1)-1975* shall apply.

2.2 Type Tests — Tests carried out to prove conformity with the specification. These are intended to prove the general qualities and design of a given type of wiper blade.

2.3 Acceptance Tests — Tests carried out on samples taken from a lot for the purpose of acceptance of the lot.

2.4 Routine Tests — Tests carried out on each wiper blade to check requirements which are likely to vary during production.

3. CLASSIFICATION

3.1 Wiper blades are classified into the following two categories on the basis of their application requirements:

a) Wiper blades for flat screen, and
b) Wiper blades for curved screen.

4. GENERAL REQUIREMENTS

4.1 While specifying a wiper blade, the following details shall be furnished:

a) Whether intended for use on flat screen or curved screen,
b) Length of blade,
c) Fixing arrangement,
d) Corresponding arms section, and
e) Finish.

4.2 Wiper Blades for Flat Screens

4.2.1 The length of the wiper blade shall be measured on the element from edge to edge when laid on a flat surface ensuring that the element touches the flat surface uniformly.

4.2.2 The recommended overall dimensions of wiper blades for flat screens are given in Table 1, read with Fig. 1.

---

*Specification for electrical wind screen wipers: Part 1 Wiper system.

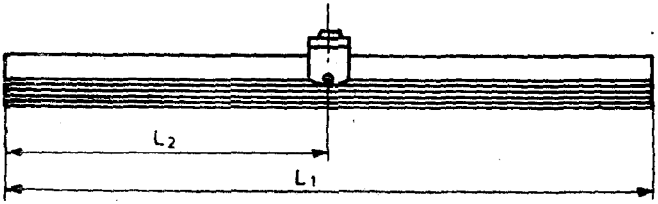


FIG. 1 WIPER BLADE FOR FLAT SCREENS

TABLE 1 DIMENSIONS OF WIPER BLADES FOR FLAT SCREENS

LENGTH, L_1	LENGTH, L_2	TOLERANCE ON L_1 and L_2	CORRESPONDING ARMS SIZE (NOMINAL)
(1)	(2)	(3)	(4)
mm	mm	mm	mm
230	115	±5	7·8 × 1·5
250	125	±5	7·8 × 1·5
280	140	±5	7·8 × 1·5
300	150	±5	7·8 × 1·5

NOTE — These lengths are only for the purpose of guidance and are based on current usage in the country. Actual length shall, however, be decided mutually between the purchaser and the manufacturer based on the requirements.

4.2.3 Fastening arrangement for wiper blades for flat screens shall be as shown in Fig. 3. The details of the fastening arrangements for wiper blades for flat screens including details of positive lock preventing sliding movement of wiper blades shall be included in due course.

4.3 Wiper Blades for Curved Screen

4.3.1 The length of the wiper blade for curved screen shall be measured on the element from edge to edge when laid on a flat surface ensuring that the element touches the flat surface uniformity.

4.3.2 The recommended overall dimensions of wiper blades for curved screens are given in Table 2, read with Fig. 2.

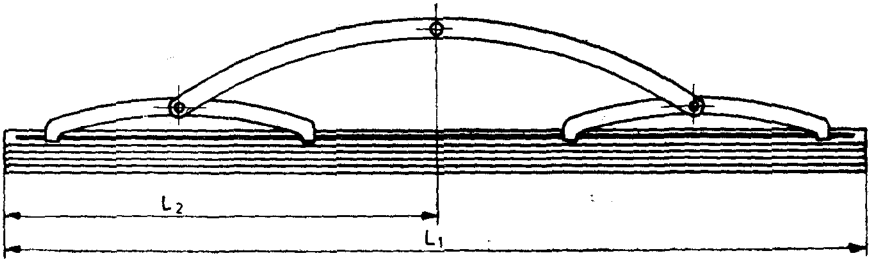


FIG. 2 WIPER BLADE FOR CURVED SCREENS

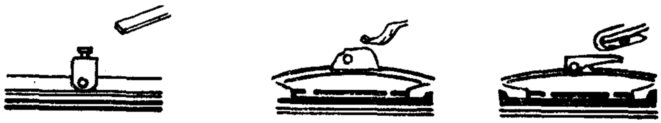
TABLE 2 DIMENSIONS OF WIPER BLADES FOR CURVED SCREENS

(*Clause* 4.3.2)

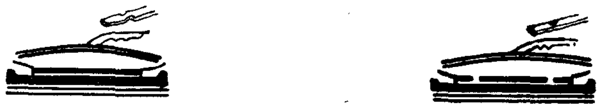
LENGTH, L_1 (1) mm	LENGTH, L_2 (2) mm	TOLERANCE ON L_1 AND L_2 (3) mm	CORRESPONDING ARMS SIZE (NOMINAL) (4) mm
250	125	± 5	5·2 × 2
280	140	± 5	5·2 × 2
300	150	± 5	5·2 × 2 (7·8 × 1·5) Optional
330	165	± 5	7 × 2·5
350	175	± 5	7 × 2·5 (7·8 × 1·5) Optional
380	190	± 5	7 × 2·5
430	215	± 5	9·5 × 2·5
510	255	± 5	9·5 × 2·5
600	300	± 5	9·5 × 2·5
650	325	± 5	9·5 × 2.5
700	350	± 5	9·5 × 2·5

NOTE — These lengths shall be only for the purpose of guidance and are based on current usage in the country. Actual length shall, however, be decided between the purchaser and the manufacturer based on the requirements.

4.3.3 Fastening arrangements for wiper blades for curved screens shall be as given in Fig. 3 and 4.

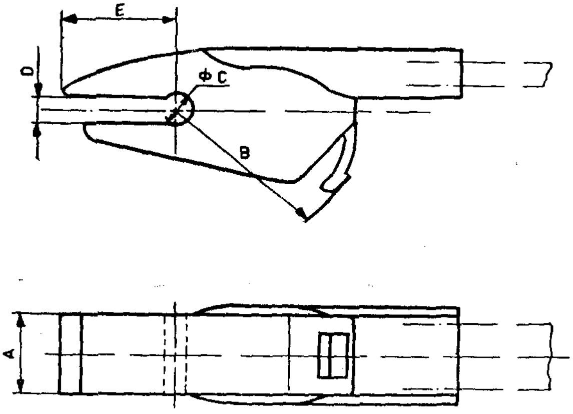


a) Clip Type b) Hook Type c) U-arm Type

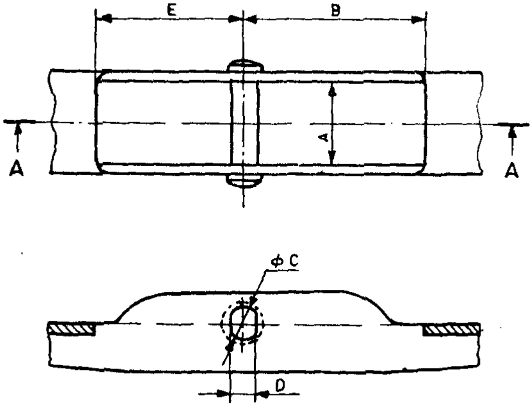


d) Notched bayonet Type e) Bayonet Type

FIG. 3 FASTENING ARRANGEMENT FOR WIPER BLADES FOR FLAT AND CURVED SCREENS



CLIP-WIPER ARM



SECTION AA

HOLDER-WIPER BLADE

FIG. 4 MOUNTING DETAILS (WIPER ARM AND BLADE)

5. MARKING

5.1 The wiper blades shall be marked with the following information:

a) Manufacturer's name or trade-mark,

b) Marking of application/type identification number,

c) Month and year of manufacture, and
d) Country of manufacture.

5.1.1 The wiper blades may also be marked with the ISI Certification Mark:

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions, under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

6. TESTS

6.1 Classification of Tests

6.1.1 *Type Tests* — The following shall constitute type tests:

a) Visual examination (*see* **6.2**),
b) Dimensional check (*see* **6.3**),
c) Performance test (*see* **6.4**),
d) Endurance test (*see* **6.5**),
e) Chemical resistance test (*see* **6.6**),
f) Ageing test (*see* **6.7**),
g) Vibration test (*see* **6.8**),
h) Dry heat test (*see* **6.9**),
j) Cold test (*see* **6.10**),
k) Corrosion resistance test (*see* **6.11**), and
m) Contamination test (*see* **6.12**).

6.1.1.1 *Criteria for approval* — Seven samples shall be submitted for testing together with the relevant data. These samples shall be tested according to the sequence given in Appendix A. The testing authority shall issue a type approval certificate if the wiper blades are found to comply with the requirements of tests given in **6.1.1**.

6.1.1.2 In case of failure in one or more tests the testing authority may, at its discretion, call for fresh samples not exceeding twice the number of original samples and subject them to test(s) in which failure occurred. If in repeat test(s) no failure occurs, the test(s) may be considered to have been satisfied.

6.1.2 *Acceptance Tests* — The following shall constitute acceptance tests:

a) Visual examination (*see* **6.2**),
b) Dimensional check (*see* **6.3**), and
c) Performance test (*see* **6.4**).

6.1.2.1 A recommended sampling procedure for acceptance tests is given in Appendix C.

6.1.3 *Routine Tests* — The following shall constitute routine tests:

a) Visual examination (*see* **6.2**), and
b) Performance test (*see* **6.4**).

6.2 Visual Examination — The wiper blade shall be visually examined for proper assembly and finish. It shall be free from flaws and damages.

6.3 Dimensional Check — The wiper blade shall be checked for overall dimensions. The samples shall conform to the outline dimensions specified by the manufacturer or the preferred overall dimensions given in **4.2.2** and **4.3.2**.

6.4 Performance Test

6.4.1 *Clarity of Wipe* — The test equipment shall be as shown in Fig. 5. The wiper blade fitted with suitable wiper arm, shall be mounted on the glass surface, in the manner in which it is mounted on the vehicle. Force exerted by the end of the arm at the centre of the blade shall be at least 28 g/25 mm of the blade length. Clean oil free water shall be sprayed on the glass surface so that maximum amount of water is deposited on the screen.

6.4.1.1 *Test conditions*

a) The assessment of results shall be made at normal ambient temperature, after a time period as follows:

Relative Humidity, Percent	*Duration of Test,* s
Above 70	4
70 to 60	3
Below 60	1

b) The glass surface shall be clean and free from stains due to oil or other materials.

c) The assessment of results, shall be made with the eye at a distance of 50 cm from the screen.

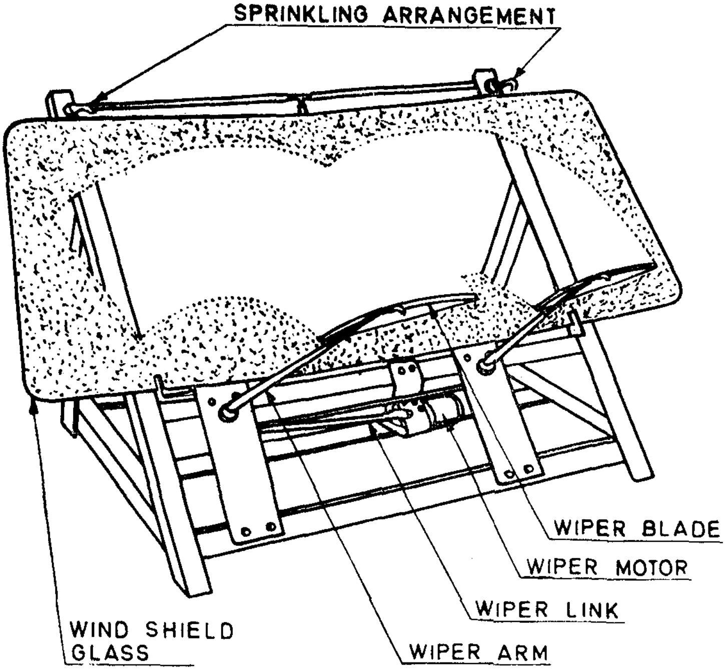


FIG. 5 RIG FOR WIPING TEST

NOTE — The screen shown is for reference only. The actual wind screen of the vehicle should be used for this test.

6.4.1.2 *Standard of wipe* — The following shall be the explanation of terms for the assessment of results:

a) Hair lines	Non-wiped part as a very fine line not wider than 0·5 mm
b) Heavier lines	Non-wiped part not wider than 1 mm
c) Wide lines	Non-wiped part as a velt with 1 to 20 mm wide and contains the group of hair lines, heavier lines and non-wiper layer
d) *M* zone	Shaded zone of wiped area (*see* Fig. 6)
e) *S* zone	The zone outside *M* zone in the wiped area (*see* Fig. 6)

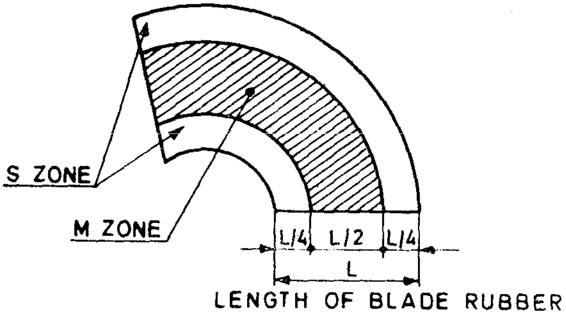


FIG. 6 WIPING AREA

6.4.1.3 *Requirements* — The clarity of wipe shall be within limits as follows:

M Zone			*S Zone*		
Hair Line	Heavier Line	Wide Line	Hair Line	Heavier Line	Wide Line
3	1	0	5	2	0

NOTE — The limits of uncleared parts, which are according to the glass form, near the inner and outer surroundings and the return point of the blade, may be determined by agreement between the manufacturer and the purchaser.

6.4.2 *Blade to Screen Friction* — The friction between wiper blade and the windshield shall be determined by using a 6 to 7 mm thick, 1 200 mm diameter glass disc placed in a vertical position and rotated at a speed of 23 RPM by a motor of at least 0·5 HP.

The wiper blade and arm assembly with free axis of rotation is clamped to the bench resting radially on the glass so that wiper blade is at right angles to the glass and is with maximum arm loading. The frictional force shall be measured with the help of a dynamometer.

The dry operation test shall be performed by rotating the glass disc in both the directions of rotation in turn and measuring the frictional force in *N*. The load divided by the length of the wiper blades in motors shall be between 1 and 3.

6.5 Endurance Test — The test shall be conducted as specified in **4.3.3** of IS : 7827 (Part 1)-1975*. Force exerted by the end of the arm at the centre of the blade shall be at least 28 ± 2 g/25 mm of blade length. The test shall be conducted for 500 hours.

---

*Specification for electrical wind screen wipers: Part 1 Wiper system.

6.5.1 After the test, the wiper blade shall not show any evidence of damage and shall be subjected to test specified in **6.4.1**.

The clarity of wipe shall be within limits as follows:

M Zone			*S Zone*		
Hair Line	Heavier Line	Wide Line	Hair Line	Heavier Line	Wide Line
5	2	0	7	3	2

6.6 Chemical Resistance Test — A section of the wiper blade element shall be kept in a 50 percent solution of methyl or isopropyl alcohol for a period of 24 hours.

6.6.1 At the end of the above period, the increase in weight of the sample shall not exceed 2 percent of the initial weight.

6.7 Ageing Test — A 150 mm specimen of the wiper blade element shall be installed in a suitable clamping fixture described in Appendix B. The specimen shall be stretched to cause an extension of 15 percent measured between the gauge marks that are 100 mm apart. The mounted specimens shall then be exposed for 48 hours in an ozone free atmosphere.

6.7.1 The specimen shall then be placed in an ozone chamber for a period of 72 hours. The test chamber shall be operated at ambient temperature and at a concentration of 50 ppm by volume. The samples shall withstand the test with a rating of 2 or better as defined in ASTM D 1171. (A suitable version of ASTM D 1171 will be added later.)

6.8 Vibration Test — The wiper blade with suitable wiper arm, shall be mounted on a vibrating machine, in the manner in which it is fitted in the vehicle, and subjected to vibrations as specified in IS : 2106 (Part XVI)-1971*. The conditions for the test shall be as follows:

Frequency range	10 to 55 Hz
Displacement amplitude	0·35 mm
Total duration	3 hours

---

*Specification for environmental tests for electronic and electrical equipment: Part 16 Vibration test.

6.8.1 At the end of the test the wiper blade shall not show any evidence of mechanical failure or rattling and shall pass the performance test specified in **6.4.1**.

6.9 Dry Heat Test — The test shall be conducted as specified in IS : 9000 (Part 3/Sec 3)-1977*. The wiper blade shall be exposed to a high temperature of 70 ± 3°C for 4 hours.

6.9.1 At the end of the test the wiper blade shall be allowed to come to atmospheric conditions. The wiper blade shall not show any evidence of damage and shall pass performance test specified in **6.4.1**.

6.10 Cold Test — The test shall be conducted as specified in IS : 9000 (Part 2/Sec 3)-1977†. The wiper blade shall be exposed to a low temperature of −10°C for 2 hours.

6.10.1 At the end of the test the wiper blade shall be allowed to come to atmospheric conditions. The wiper blade shall not show any evidence of damage and pass performance test specified in **6.4.1**.

6.11 Corrossion Resistance Test — The test shall be carried out as specified in Appendix C of IS : 1884-1981‡.

6.11.1 After removal from the salt spray chamber, the wiper blade shall not show any sign of corrosion or electrolytic action and shall pass the performance test specified in **6.4.1**.

6.12 Test for Contamination — Under consideration.

---

*Specification for basic environmental testing procedures for electronic and electrical items: Part 3 Dry heat test, Sec 3 Dry heat test for non-heat dissipating items with gradual change of temperature.

†Specification for basic environmental testing procedures for electronic and electrical items: Part 2 Cold test, Sec 3 Cold test for non-heat dissipating items with gradual change of temperature.

‡Specification for electric horns for motor vehicles (*second revision*).

APPENDIX A

(*Clause* 6.1.1.1)

SEQUENCE OF TEST FOR TYPE APPROVAL

Cl No.	*Test*	*Sequence*						
		1	2	3	4	5	6	7
6.2	Visual examination	×	×	×	×	×	×	×
6.3	Dimensional check	×	×	×	×	×	×	×
6.4	Performance test	×	×	×	×	×	×	×
6.5	Endurance test	×	×					
6.6	Chemical resistance test			×				
6.7	Ageing test				×			
6.8	Vibration test					×		
6.9	Dry heat test						×	
6.10	Cold test						×	
6.11	Corrosion resistance test					×		
6.12	Contamination test							×

APPENDIX B

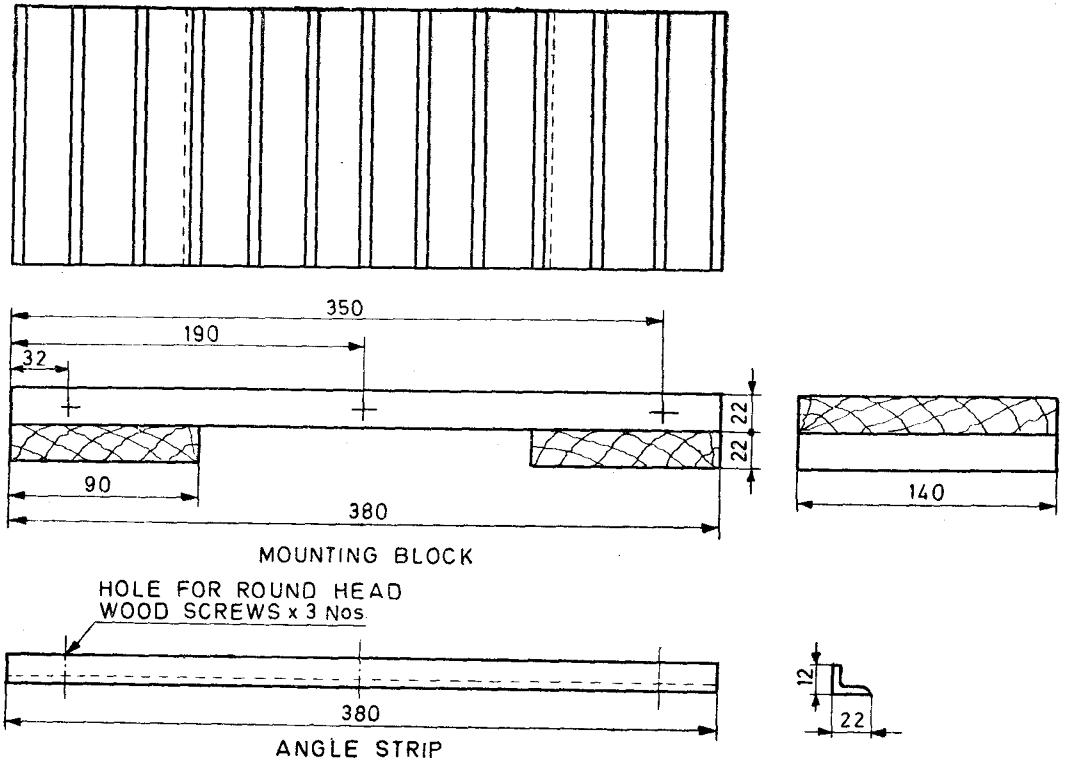
(*Clause* 6.7)

EQUIPMENT FOR AGEING TEST

B-1. THE EQUIPMENT FOR AGEING TEST SHALL CONSIST THE FOLLOWING

B-1.1 Mounting Block — A rectangular wooden block shall be used for supporting the specimens. The block shall be 140 mm wide and approximately 380 mm long and shall have a thickness of not less than 22 mm. The block shall have the grain running lengthwise and shall be suitably reinforced on the back to prevent warping. Both of the 380 mm edges of the face carrying the specimens shall be rounded with a 3 mm radius. The details of construction are shown in Fig. 7. The block shall be plained smooth and painted with two coats of clear lacquer.

[×] Samples to be tested.



All dimensions in millimetres.

Fig. 7 Details of Ageing Test Equipment

B-1.2 Fasteners — Aluminium tacks, or other inert material fasteners shall be used for fastening the specimens to the edges of the wooden block.

B-1.3 Angle Strips — Right-angled aluminium moulding strips 13 × 22 mm and of approximately 0·75 mm thick shall be used for shielding the specimens where tacked and bent over the edges of the block.

APPENDIX C

(*Clauses* 6.1.2.1 *and* 6.11)

SAMPLING PROCEDURE FOR ACCEPTANCE TESTS

C-1. Lot

C-1.1 In a consignment, all the wiper blades of the same type and size manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.

C-1.2 The number of wiper blades to be selected from each lot shall depend upon the size of the lot and shall be in accordance with col 1 and 2 of Table 3.

TABLE 3 SAMPLE SIZE AND ACCEPTANCE NUMBER

Lot Size (1)	Sample Size (2)	Acceptance Number (3)
Up to 100	13	0
101 ,, 150	20	1
151 ,, 300	32	2
301 ,, 500	50	3
501 and above	80	5

C-1.2.1 The wiper blades shall be selected from the lot at random. In order to ensure the randomness of selection, procedure given in IS : 4905-1968* shall be followed.

C-2. NUMBER OF TESTS FOR CRITERIA FOR CONFORMITY

C-2.1 All the wiper blades selected at random in accordance with col 1 and 2 of Table 3 shall be subjected to the acceptance tests. A wiper blade failing to satisfy any of the acceptance tests shall be termed as defective. The lot shall be considered as conforming to the requirements of acceptance tests if the number of defectives found in the sample is less than or equal to the corresponding acceptance number given in col 3 of Table 3; otherwise the lot shall be rejected.

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*Methods for random sampling.

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